

THE SABER CRAB, *PLATYCHIROGRAPSUS TYPICUS*
RATHBUN, IN FLORIDA:
A CASE OF ACCIDENTAL DISPERSAL

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The earliest record of *Platychoirapsus typicus* is that of a single male specimen exhibited at the Mexican exhibit of the World's Columbian Exposition in 1893. Nelson and Goldman of the U. S. Biological Survey found two males in the Macuspana River, Montecristo, Tabasco, Mexico in 1900. In 1914 Rathbun described *Platychoirapsus typicus* on the basis of these two males. These specimens, together with one male in the Copenhagen Museum bearing the indefinite locality, "Gulf of Mexico", and one large claw (locality unknown) now in the Halifax Museum, comprised all of the known museum specimens up to 1918 when Rathbun published her review of "The Grapsoid Crabs of America". In so far as I have been able to ascertain, no further knowledge of the habits or distribution of this crab has been obtained since that time.

My interest in *P. typicus* was aroused in April 1939,¹ while I was conducting an ecological study of a small section of the Hillsborough River, Hillsborough County, Florida. I found the crab there in large numbers, and forwarded a number of specimens to Dr. Waldo L. Schmitt of the United States National Museum who corroborated my conclusion that these were the first specimens known to have been taken in the United States.

The Hillsborough River is one of the larger streams of the peninsula draining into the Gulf of Mexico. It originates in Polk County and flows in a southwesterly direction to empty into Hillsborough Bay at Tampa. Cypress swamps and hammock lands border the river along most of its course, and it is subject to flooding,² receiving considerable amounts of "swamp water" from its upper reaches, which give it the typical coffee-color of many streams of the peninsula. However, it also receives a large part of its water from a number of calcareous springs and during the low water stages the stream is quite clear. At various points along its course the water flows over shallow limestone beds, and at several places there are distinct rapids. In most of the shallow

¹It was my intention to carry on observations on this crab for a longer period; however, my plans were disrupted when I joined the Army in 1942. Since I will not be in Florida for the next few years to pursue my investigations, it seems desirable that I publish my findings.

²The U. S. Geological Survey recorded a variation in water level of 7.57 ft. during the period 1938-1941 at their gauge station at 40th St. in Tampa.

portions outcropping rocks are absent, and large beds of *Vallisneria* extend across the full width of the river.

The Saber Crab was found in seven different localities along a ten mile section of the river—the locality nearest its mouth being just above the town of Sulphur Spring, about nine miles above Hillsborough Bay. All seven of the localities where the crabs have been found were in the shallow reaches referred to above.

My acquaintance with other parts of the river led me to suspect that the crabs would occur in a shallow portion of the river in the Hillsborough River State Park but an intensive search of this situation proved futile. However, Mr. Oscar Baynard, then superintendent of the Park, informed me that just after World War I he had taken on a number of occasions "a small brown crab hanging on the rocks". In all probability this was the Saber Crab.

The apparent local concentration of crabs in shallow rocky portions of the river is possibly due in part to the relative ease with which they are collected in such situations. During periods of low water, however, deeper portions of the river were explored by swimming under water with water goggles. Here the crabs were found to be scarce, and such populations as were discovered were localized around occasional rocks and logs.

The largest population of crabs encountered in the river was at the ruins of a dam, known at Tampa as the "Old Dam", located between 40th and 56th Streets.³ The remains of this dam are located in a shallow portion of the stream where the water flows over a bare limestone bed. The dam was constructed of wood, and was destroyed by fire many years ago, and the water has broken through all along its face. Enough of the original structure remains to cause a backing up of the water above it to form pools, and the water pours rapidly through the old Sluiceway and over broken areas.

At the "Old Dam" the crabs could be found in large numbers among rocks and submerged timbers. At either end of the dam crabs were found in tunnels in the clay banks. This latter observation is in agreement with that of Nelson and Goldman who reported the crabs as living in clay holes in the bank just above the water line in the Macuspana River, Mexico (Rathbun 1918: 281).

At the "Old Dam" the crabs were easily observed at night with a head light and in the course of one evening I counted 600 individuals

³In June 1945 a new dam between 22nd and 30th Streets was completed, and as a result the impounded water covers the site of the "Old Dam".

some of which were in the water and others clinging to the rocks just above the water level. There seemed to be a tendency for the animals to congregate in the swiftest reaches of the stream.

Several times I noted crabs with anatomical abnormalities (which made them recognizable as individuals) in the same small area for a period of a week. One of them was observed three consecutive nights within a five foot radius.

At the north end of the dam is a channel through which the water flows during high stages. When the water recedes isolated pools are left in the area, and a few crabs can be found in them for weeks afterward.

A slight rise in the water level is accompanied by an increase in the number of crabs seen at night; however, if the water continues to rise the crabs become exceedingly hard to find. While it was difficult to find the crabs during high water several interesting facts were observed. Of the few individuals that ventured out on the top of the rocks, about 95% were males. A few crabs were found on top of the hyacinth plants which were lodged against the dam. Some individuals were found on the wooden structure of the dam, and at least 50% of these were females. This was the only place I was able to find females during the high water stage.

At night the crabs were observed feeding on the algae and diatomaceous mats growing on the submerged rocks and timbers. The chelae were used in scraping the algal growths from the substratum and this material was passed back to the mouth. The male used only the small chela in feeding. The question immediately arises as to what use is made of the large curiously sculptured chela. The only time I have observed its being put to use was when two males, approaching one another from opposite sides of a stone, met and placed the flat surfaces of their chelae together, but after a few minutes of pushing against one another separated and went away.

A cursory examination of the stomach content of a few specimens disclosed the following organisms. Most abundant were *Oscillatoria* sp., *Vaucheria* sp., and a number of diatoms among which were *Namphora ovalis*, *Navicula* sp., and *Tabellaria fenestrata*. In addition, *Pediastrum simplex*, *Scenedesmus* sp., *Cladophora* sp., *Closterium* sp., *Tetraedron* sp., and other green filamentous algae were found. Also present were *Chara*, sponge spicules, a nematode, several caddis fly larvae, and some insect fragments. On two occasions I noted *P. typicus* feeding on dead fish.

Periodic observations on the crab at the "Old Dam" during 1939

revealed a marked decrease in the population during November, and by the end of the month intensive searching was necessary to locate a single individual. This dearth of crabs continued until March 1940 when they again appeared in numbers. The same fluctuation in population density was observed again in 1940-41. At no time during the period of November to March, in either year, was a female observed carrying eggs, and no very small crabs were seen at any time during the year—the smallest specimens obtained were taken in May 1940, and varied from 15-18 mm (width of carapace). The diminution of the population in the river at this seemingly regular period of the year suggests that *P. typicus*, like the Chinese Mitten Crab, *Eriocheir sinensis* H. Milne-Edwards, may return to salt or brackish water to pass the winter months and breed (Panning: 1938 365-370). cursory collecting in the Tampa Bay area during the two year period failed to corroborate this hypothesis, for not a single individual was seen. However, in 1941 my wife, Norma Marchand, then assistant in the Department of Biology, University of Tampa, found an unlabeled bottle in the biological collection containing a single male specimen of the Saber Crab along with a number of salt water animals. Mr. J. W. Pearson, Professor of Biology, who made the collection, did not remember the locality from which the specimens were taken but was certain that all of them were obtained from salt water in the Tampa area.

The presence of the Saber Crab in Florida, seemingly confined to the Hillsborough River⁴, and hitherto known only from the State of Tabasco, Mexico suggested to me a possible incidence of accidental dispersal and the following data seem to indicate evidence that such has been the case.

Mr. John A. Anderson, Secretary of the Tampa Box Company has kindly furnished me the following information. The Tampa Box Company, manufacturers of cedar cigar box lumber, maintains a logging mill on the Hillsborough River about five miles from the Bay where, before World War II, imported logs from Mexico were cut in sections before being hauled to their factory.

The large cedar logs were first imported from Mexico in 1915 and this importation continued until the early months of World War II. (Prior to that time the logs were obtained from Cuba.) These logs, 20 to 25 feet long and approximately 50 inches in diameter, were cut in Mexico in the dry season, dragged to dry stream beds and floated

⁴On a number of occasions I visited other streams flowing into Hillsborough and Tampa Bays in search of additional localities records for *P. typicus*. In none of them did I see a single individual.

to the coast during the rainy season where they were loaded on ships. The logs were unloaded at the mouth of the Hillsborough River, and made into large rafts which were floated upstream to the mill station. They were sometimes left in the river as long as six weeks before being stacked on shore. The Mexican port from which most of the logs were shipped was Alvaro Obregon, in the State of Tabasco.

Inquiries at the mill station revealed that the employees there were familiar with the crab, specimens often being found in cracks of the logs when they were sawed. Along with the crabs, snakes and turtles were often seen. An employee of long standing informed me that the crabs—to which he applied the very descriptive name of "Saber Crabs"—were unknown in the river until the importation of logs from Mexico began.

On November 6, 1940, I inspected the cargo deck in a ship which had just unloaded logs at the Tampa Harbor. Here I found several Saber Crabs, as well as four frogs, and was informed that a snake had been killed there shortly before my arrival. This ship had been loaded at Frontera, Puerto Mexico—State of Tabasco.

On the basis of these data it seems probable that the Saber Crab was introduced into the Hillsborough River some time during or subsequent to 1915 by means of logs imported from Tabasco, Mexico.

MORPHOLOGICAL NOTES

My specimens show little variation from the description given by Miss Rathbun. It has been observed that about half of the males have the right chela enlarged and half the left; in no specimen did I find a large one on both sides. Among the two hundred specimens I have preserved there are several males showing various stages in the regeneration of the large chela. In the early stages the two chela are about the same size and shape, and in dorsal aspect the males cannot be distinguished from the females—the latter never possess an enlarged chela. The first sign of any differentiation of the enlarged chela is a pronounced flattening of its outer face and a slight proximally expanded projection. The opposable margins of the fingers in this stage are little different from those described below.

Both the immovable and movable fingers of the small chelae (both male and female) are essentially alike in structure, and are modified in a peculiar manner which seems to me to be correlated with the feeding habits of the animal. The proximal two-thirds of the opposable margin of each finger bears a row of six or seven tubercles which are larger distally. The distal one-third is provided with a prominent

sharp corneous ridge which extends along the outer side, across the extreme tip and for a short distance along the inner distal margin thus forming a basket-like structure resembling a jai alai basket (See fig. 1). The cutting edges of the two fingers meet, and would certainly serve as excellent tools for scraping the algal growths from flat surfaces.



Figure 1.

Saber Crab—Male above, female below.

A careful examination of the opposable margins of the fully enlarged chela of the male reveals a similar structure; however, the cutting edges have been converted into a series of large tubercles.

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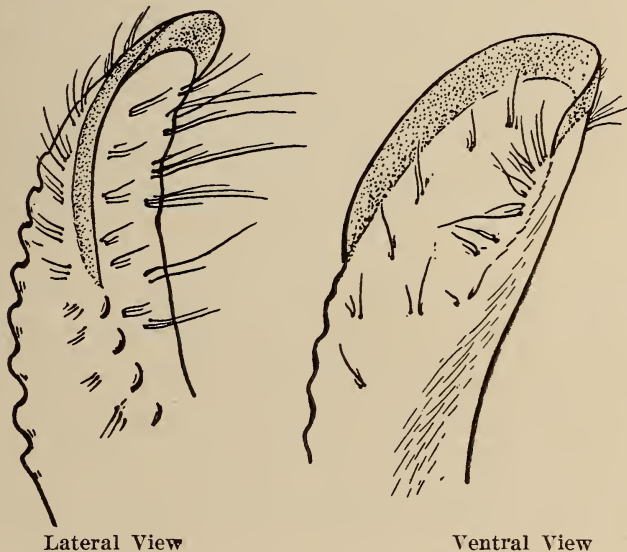


Fig. 2. Right Cheliped of Saber Crab.

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